

A B S T R A C T

In an electric motor having high-speed and low-speed brushes, durability is improved and vibration/noise is reduced.

5 The electric motor has a low-speed brush 21a, a high-speed brush 21b, and a common brush 21c. Formed in the electric motor are a first coil 7A1 which is wound between given slots 11, and a second coil 7A2 which is wound in a direction opposite to a direction of the first coil 7A1 between slots 11 existing at

10 positions point-symmetric to the given slots 11 with respect to a center of a rotation shaft. An armature coil 7 is formed by the first and second coils 7A1 and 7A2. If the armature coil 7 is short-circuited by the high-speed brush 21b, the first coil 7A1 and the second coil 7A2 of the short-circuited armature coil

15 7 exist at positions symmetric to each other with respect to an axis line extending through the center of the high-speed brush 21b and the center of the rotation shaft.